DOCUMENT RESUME

ED 072 624 EM 010 709

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|---|---|
| AUTHOR | Heinberg, Paul |
| TITLE | Creativity Games. |
| PUB DATE | 1 Sep 72 |
| NOTE | 24p.; Paper presented at the American Psychological Association National Convention (Honolulu, Hawaii, September 1, 1972) |
| EDRS PRICE | MF-$0.65 HC-$3.29 |
| DESCRIPTORS | *Classroom Games; Creative Activities; Creative Thinking; *Discovery Learning; *Educational Games; Elementary Education; Instructional Systems; Learning Activities; *Sequential Learning |
| IDENTIFIERS | Hawaii |

ABSTRACT

Learning systems or creativity games are innovative strategies for teaching a variety of subjects with maximum rewards for teachers and students alike. By definition, learning systems are in opposition to the conventional teaching formula. They are productivity rather than procedurally oriented, and they rely on discovery rather than reception learning. Learning systems have 3 characteristics: a productivity index (PI); rules; and roles. The PI is simply a measurement device for administrative evaluation. The rules insure an orderly progression through the learning sequences. And the roles are the designations the learner assumes as the system advances. Primarily the learner becomes not only the tutor and tutee, but also an evaluator and innovator. The attributes of learning systems vs. conventional methods are reviewed in this report, along with four learning systems which the speaker either developed or has used in elementary schools in Hawaii. (MC)

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# Creativity Games

Paul Heinberg

(Paper delivered at the American Psychological Association national convention, Friday, September 1, 1972, in the session, "Excitement in Learning")

If the power to innovate education changes were vested in school psychologists, my paper today would be entirely different. I would merely provide you with a full description of various learning systems that I've developed or supervised the development of, and I'd report to you all of the data about their effectiveness.

But the world is not like that. Teachers find themselves in a system in which they get paid regardless of how much their students learn or precisely what. In fact, nobody out there above the level of the classroom teacher is systematically measuring what children learn or from whom. Hence, the job benefits of being a teacher must lie elsewhere. They lie in teachers and students being reinforced for believing that the students are learning, that what they are learning is important, and that the learning process is enjoyable for both of them. Many teachers have read Rosenthal's Pygmalion in the Classroom[1] and they know that the "A" student is one who can program teachers into believing that he's an "A" student, and the students know that they must remain dependent on their

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teachers because that dependency of children on their teachers is about all that's left that can turn their teachers on.

I'm sure that at least a few of you believe that the educational system rewards the innovative teacher. It does not. Such a teacher is a threat to every colleague, because that is the nature of the system. I realize, therefore, that some of you are here because you seek some package to hand to teachers to innovate, and you will have done your share to bring better education to the world. But the cure for education's ills is not the teacher; it never has been. The thing that's sick is the system, not the teachers; the system needs the cure.

Hence, what I'm going to talk about are learning systems.[2] Learning systems are something you can innovate which rewards students and rewards administrators and, properly innovated, should threaten none of them. My handouts will describe several learning systems in detail with the data that are relevant for each. In my remarks I will not describe any system in detail. Rather I will spend the bulk of this valuable time trying to provide some strategies for innovating learning systems or, as the chairman of this session refers to them, Creativity Games.

But first, it is extremely important that what is being called a learning system or a Creativity Game is clearly understood. A learning system has three characteristics: a

productivity index, rules and roles. And each of these looks like something else.

A productivity index sounds like another word for a behavioral objective. And in one sense it is. It seems safe to assume that nowadays the term behavioral objective is known to practically everyone concerned with education. Specification of behavioral objectives runs the gamut from delighting budget makers to horrifying English teachers.[3]

But what the pros and con artists don't realize is that every teacher can always specify his behavioral objectives. The argument pro or con specifying behavioral objectives is a misleading argument. Behavioral objectives can be specified in three ways. Behavioral objectives can be specified in terms of deity, dad or data.

The deity claim is that a subject is worth learning because decades of tradition and common sense tell us that it is worth learning. The objective is to engage in a process, not to achieve an outcome. The proof of learning is participation in the process. And that process is an inspiring one. A Deityist talks of "learning for learning's sake" and reminds us that "learning should be fun."

The dad claim is that the learner is learning what it is important to learn because I--the authority--who have been ordained an authority by a laying on of hands say that it is worth learning. My years of experience as an expert and my

education in the field are proof that what I say is so. And the proof of learning is that I, the expert, perceive that he has learned.

The data claim is that what is worth learning is what can be measured pre and post and tested for significance between them. And what the Dataists don't measure is somehow assumed not to have significantly changed, at least not for the worse.

We should not confuse the issue by differentiating between Dataists and the others in terms of reliability. Decades of teaching mathematics as a science divorced from reality and of teaching languages instead of communicating with languages give great reliability to the deity claim. And a nation-wide curriculum of thirteen years of English literature before high school graduation supports the Dadists' claim for reliability even if the teachers of that subject occasionally disagree about which authors should be taught and when.

In designing a learning system, behavioral objectives are not "where it's at." The Deityists, Dadists and Dataists simply disagree on whether to focus on what happens to teachers in terms of what happens to learners, or whether to focus on what happens to learners in terms of what happens to teachers. It is like arguing whether the refrigeration system should be viewed from the compressor's viewpoint or from the thermostat's viewpoint. Behavioral objectives are either learner-centered or they are teacher-centered. They are not system-

centered. Systems objectives are "where it's at." In a systems approach the argument is not deity or dad or data because the focus is not on the learner, or on the teacher, or on the teacher of teachers; it is on the system. In system design there isn't any tradition for the Deityists to appeal to, there isn't any expertise that is sanctioned by a doctorate in educational systems analysis, and there isn't any data about teachers or learners that sanction one system as more productive than another. Hence a productivity index is not threatening when a behavioral objective is. And for all the right reasons.

To state the matter quite generally, system design begins with a specification of system outcome, with what change is to occur in persons in every role.

The important thing about specifying a system's outcome--and a very difficult thing it is to learn--is that the product of a system should be specified as one productivity index. I use the word index because we are talking about what a system produces, and every system produces change. A productivity index is a formula which encompasses all of the variables that are expected to vary in all of the persons that will be involved in any way in the system.

It is seldom if ever true in the real world that any system can produce a change in anything without producing any changes whatsoever in any other things. Systems tend to

produce changes, not change. The productivity index, therefore, is a single variable which encompasses many variables and expresses the relationships among them.

If the productivity index were to involve only one variable and that one only in the learners, the likely result is that the one process which produces the most change in the desired direction most economically also produces--when you get around to noticing it--several other changes for the worse. Unfortunate surprise is a plague of the simple-minded. Hence, we cannot leave off until we have specified all of the important variables affecting all of the populations within the system, and how each of them is weighted to measure the overall productivity of the system.

Bad testing and bad teaching nowadays is probably not often due to not specifying the goal of such testing or teaching; it is probably quite often due to focusing at any time on only one variable in persons in only one role. And the behavioral objective furor among Deityists, Dadists and Dataists confuses us into believing that one of these three -ists is right. By specifying the system's goals as a single productivity index we provide no identifiable threat to any of them (and it actually is not threat), and we tend to avoid the plague of the simple-minded, unfortunate surprise.

Once the productivity index has been derived, various processes for producing the index can be explored.

And herein lies the second difference between a learning system and programed instruction or well-run classrooms. Processes are the various ways in which the product--a gain in the productivity index--can be achieved. And processes can be specified in two general ways: either as procedures or as rules.

In educational processes, procedures are what persons in that system do to enable learners in all roles to reach their learning goals. If you were to give any educated person the problem of specifying a process to achieve a specified goal, it is extremely likely that he will specify procedures rather than rules. Rules are specified constraints on behavior; procedures are specified behaviors. The importance of this difference can at times be overwhelming.

For example, if we assume that learning proceeds in a basically logical way, then we consult Bloom[4], Simpson[5] and Krathwohl[6] to build our taxonomy of sub-objectives, and we move the learners through them in that sequence. But the appeal today is for more individualized instruction. So we invent a concept called learning style, and we give the learners some choice about which sub-objective to work towards next. But all of this, as Ausubel[7] would say, is reception learning rather than discovery learning. Or I would say that learners are being told how to behave, not how to know when their behavior wins. When learners are told how to behave,

extrinsic reinforcers must be provided because there aren't any intrinsic ones. When the goal is clear but the route to it must be discovered, there is a loss in intrinsic reinforcement if the extrinsic reinforcers are too large.[8]

When a process is specified in terms of procedures, a large investment must be made in resources to insure adherence to those procedures. Systems can be classified as either morphostatic or morphogenetic.[9] A morphostatic system suppresses deviations. A morphogenetic system amplifies deviations. A morphostatic system is procedure-oriented. It is maintained by punishments, and the power to punish is assigned politically. It is a system of procedures that are sanctioned by tradition. A morphogenetic system is productivity-oriented. It is maintained by rewards based on contributions to the productivity index, and the power to reward is assigned to rules rather than to rulers. It is a system of rules in which the novel procedure that contributes most to the index gets all the favorable attention.

A learning system, then, is not a specified course of instruction. It is not a set of procedures for learners to go through with supervision by and assistance from a teacher, or learning expediter. It is a kind of game--or usually a series of games--in which winning is clearly defined but how to win is what each person in every role must discover for himself. There is no place for the vocal kibbitzer who merely wants to help.

We now have two definitions of a learning system. It involves a multivariate equation to express the weight and polarity of every change that the system is intended to produce in persons in every role. And it sequences learning through a series of increasingly difficult games, in each of which winning is clearly specified but how to play--the process--must be discovered by every person in every role.

In a learning system rules are invented to insure that learners progress through the series of games in such a way that increasing difficulty is assured. The three major ways to increase the difficulty of games are to increase the number of variables that are involved, to increase the number of units that must be produced to win (a variable ratio schedule), and to decrease the time allowed. Under these conditions "learning style" loses its mystique since all humans seem to have a single learning style.

A learning system has three characteristics: a productivity index, rules and roles. In designing a learning system roles are selected primarily to insure verisimilitude in terms of real-life situations in which that learning will be used. One rubric that I find to be extremely useful in selecting roles is the 9-cell matrix shown in Figure 1. Competence involves storage of information about the world, about behavior, or about oneself. Performance involves coping in a specific situation. Skill involves coping in new

| | COMPETENCE | PERFORMANCE | SKILL |
|---|---|---|---|
| COGNITIVE | ability for storing symbolic information | ability for accessing stored symbolic information | ability to apply cognitions in new situations |
| BEHAVIORAL | ability to explain how an activity is performed | ability to engage in a particular type of behavior based on observations of performance | ability to operate in new environments to reduce aversive stimuli |
| AFFECTIVE | extent to which person reports that he generally seeks or avoids a particular person, thing, event, activity, etc. | extent to which a person seeks or avoids a particular person, thing, event, activity, etc., based on his participation or non-participation when appropriate alternatives are provided | extent to which a person seeks or avoids new experiences or new environments |

situations. A person has competencies, performances, and skills in each of three areas: cognitions, psychomotor behaviors, and affects (tendencies to approach and avoid various objects, activities or events).

Unfortunately, most of conventional education is based on two absurd formulae. Learner competence plus our hope equals learner performance. Learner performance plus our hope equals learner skill. And our hope is usually defined as the learner's motivation, his willpower, his drive, or his initiative. We teach competence in language and hope for the ability to communicate, a performance. We teach pure math and hope for the ability to assign and manipulate numbers that refer to things, a skill. A learning system gives no easy out of blaming the learner for a lack of transfer. If you are designing a learning system to produce a skill, then the PI--the productivity index--specifies the skill, not the assumed precursors of it. And it is not true that, when performance exists, competence exists. One can do without knowing how or why. In fact, competence may actually impede the acquisition of performance. And it is also not true that, when skill exists, either competence or performance exists. The ability to cope in new situations does not indicate the ability to cope reliably in a customary situation. In fact, improve reliability of performance may actually impede the acquisition of skill. The 9-cell matrix indeed

contains 9 different cells in the sense that, if the goal is any one of them, the route must be directly to that cell and not through any other.

And so we come at last to creativity. I define creativity as skill, skill in each of the three areas: cognitive, behavioral and affective. That is, creativity is in knowing how to cope with new situations, it is coping with new situations, and it is delighting in coping with new situations. Since cognitions are useful for producing behaviors in others but are not useful in producing behaviors in oneself, this means that the learner must play two roles in the learning system, as tutor and as tutee. As tutor he acquires cognitive skill. In being tutored he acquires behavioral performance, not, unfortunately, behavioral skill. In my search for a way to produce behavioral skill, I discovered several years ago that a third role is required. For a person to learn to cope in new systems, he must learn to see each system that he is in. And that's like a fish trying to discover water. Hence, I developed the third role of extrasystemic evaluator.

I had assumed that affective skill might emerge from cognitive and behavioral skill. It did not, which supports the 9-cell matrix, but it made more work for me. I only recently discovered how affective skill could be produced.

I invented a fourth role, the role of designer and innovator of new systems for persons in the other three roles to play. I call that role the role of systems developer.[10]

So that you can better understand the nature of a learning system, I will describe briefly how the Personal Enrichment Program[11] works to produce this creativity. The handout describes its functions in detail, and the description of the Preferred Futures[12] specifies the productivity index for that system.

We began with a series of games to produce extremely high productivity in generating unique solutions to problems. Each learner as a player (tutor and tutee) serves on a 3-4 player team. This is now Part I of PEP. We found that a second stage was needed, the ability to eliminate solutions in terms of specified criteria. Again the learner serves as player. This is now Part II of PEP. We then found that, although the learners who reached all criteria could solve problems extremely well and innovate those solutions, they could not isolate a system problem from a person's perception of an unsatisfactory situation. That is, the problems they identified were specified as intrasystemic rather than extra-systemic, which means that their solutions amplified some person's potentials at the expense of others'.

We then developed Part III of PEP. It enables learners in all four roles to translate intrasystemic problems into

extrasystemic problems, and to generate alternative strategies to innovate selected plans for change.

We have field-tested these various parts of PEP, both with normal 5th graders and with EMR's of 10-13 years of age. All of the data thus far have exceeded our greatest expectations.

But we find that at least one more part of PEP is needed. That is, learners in the four roles need to learn how to utilize the various tools of English, mathematics and flow-charting to make their designing of systems easier and more fun. That involves another system, Performax,[13] that has been fully field-tested and is operational, and it involves a Part IV of PEP that is now nearing design completion and is scheduled for field-testing this coming year.

And now a final word about innovating a learning system in your school. A learning system is a series of games, and there are only a few roles for non-players to perform. A learning system is not designed to include a teacher, because a teacher is over-trained for the necessary roles of referee, groundskeeper, and scheduler of games. A learning system does its thing itself. Hence, it can be scheduled in a study hall, a counselor's office, a library, a cafeteria, or a classroom using clerical or paraprofessional personnel in the necessary roles.

Your selling point to teachers--your only selling point--should be the down time that it affords them. And your other selling job--to administrators--is to sell them on computing the productivity index. School boards consist largely of business people. Selling them on measuring the productivity of their educational system is mostly a matter of letting them know that such a thing is being done. The fact that the creativity of children is being measured does not threaten teachers. No one has charged them with teaching children to be more creative, and certainly they aren't being paid or promoted for teaching that. And so the PI, which represents changes in children's creativity, is about as threatening to teachers as measuring changes in children's I.Q. And teachers have been living with that kind of measurement for years.

In all honesty, there is no need for teachers to be threatened by a productivity index. A PI is intelligently used only when it relates changes in allocation of resources to changes in children's creativity. Teachers, instead of being threatened by a PI, will probably use it to argue for getting more of what they want.

This is the end of a rather long and difficult treatment of an extremely important matter. And, as I said at the outset, I am sorry if I have threatened your belief system by asserting that the solution for better learning of

better things is not some kind of teacher training. After decades of using that miserable model of educational innovation, you would think that someone would stop blaming the teachers and blame the miserable model. Well, I've presented an alternative, the one we're embarked on here in Hawaii. I do believe it can be sold because, once everyone understands it, it threatens no one.

For those of us who don't take sides, who really care about children, and teachers, and administrators, learning systems are a challenging opportunity, not a threat.

FOOTNOTES

[1]Robert Rosenthal and Lenore Jacobson, Pygmalion in the Classroom, Holt, Rinehart & Winston, (New York), 1968.

[2]What I call a learning system is not exactly new, nor am I its sole discoverer. Robert Mager was one pioneer in the field with what he called Learner-Controlled Instruction. (See R. F. Mager and J. McCann, Learner-controlled Instruction, Varian Assoc. (Palo Alto), 1961; Robert F. Mager, "On the Sequencing of Instructional Content," Psychological Reports, 1961, 9, 405-413; Robert F. Mager and Cecil Clark, "Explorations in Student-controlled Instruction," Psychological Reports, 1963, 13, 71-76; Vincent N. Campbell, "Research on Self-Directed Learning in the Classroon," and Robert F. Mager, "Learner-controlled Instruction--1958-1964," both in Programed Instruction, 1964, 4, 1-12.) And in 1960 a counselor, Father Charles Curran, put a group of persons who hated learning a required foreign language through a system in which they learned four languages simultaneously, each as well as students learned one in the regular courses. (See "Counseling Skills Adapted to the Learning of Foreign Languages," Bull. of the Menninger Clinic, 1961, 25, 78-93.)

[3]See the National Council of Teachers of English Resolution On the Need for Caution in the Use of Behavioral Objectives

in the Teaching of English, adopted at the N. C. T. E. annual meeting, 1969, and published in College English, 1970, 31, 529.

[4]Benjamin Bloom (Ed.), Taxonomy of Educational Objectives, I: Cognitive Domain, David McKay Co. (New York), 1956.

[5]David R. Krathwohl, et al, Taxonomy of Educational Objectives, II: Affective Domain, David McKay Co. (New York), 1964.

[6]Elizabeth Simpson, "Educational Objectives in the Psychomotor Domain," in Miriam B. Kapfer (Ed.), Behavioral Objectives in Curriculum Development, Educational Technology (Englewood Cliffs, New Jersey), 1971, 60-67.

[7]David P. Ausubel, The Psychology of Meaningful Verbal Learning, Grune and Stratton (New York), 1963.

[8]See, for example, Edward L. Beci, "Work--Who Does Not Like It And Why," Psychology Today, August, 1972, 57-58, 92.

[9]Magoroh Maruyama, "The Second Cybernetics: Deviation-Amplifying Mutual Causal Processes," American Scientist, 1963, 51, 164-179; same author, "Morphogenesis and Morphostasis," Methodos, 1960, 12, 251-296.

[10]It was only after I had discovered the fourth role that I learned about Gregory Bateson's levels of learning from

private correspondence. It is alluded to in his Steps to an Ecology of Mind, Chandler (San Francisco), 1972.

I assume, as he does, that the fourth role can be exceeded by a fifth, a teacher of systems development, but above that level we can't find anyone who's functioning. From our conversations on the matter I would say that Bateson chalks it up to exceeding the human's capacity; I incline towards our lack of having discovered a system which can produce that kind of human learning.

[11]See description attached. In the area of creativity I have discovered two programs that have been developed and field-tested. One is the Purdue Creative Thinking Program (See "The Purdue Creative Thinking Program: Research and Evaluation," Nat'l Soc. of Programed Instruction Jour., 1971, 10, 5-9.) The other is the Productive Thinking Program (See M. V. Covington, R. Crutchfield and L. Davies, The Productive Thinking Program; Series One: General Problem Solving, Educational Innovation, Inc. (Berkeley), 1966. Both of these are procedural programs rather than learning systems. The Purdue Program, now in its seventh year of development, is still plagued with variance due to teacher characteristics. To my knowledge no research on the Productive Thinking Program has been reported.

[12]See description attached.

[13]See description attached.

Personal Enrichment Program (PEP)

A learning system which enables each learner in
26-40 training hours to solve and to help others
to solve personal and social problems and to
innovate solutions effectively

1. PEP is a 4-part learning system for training groups of 3-4 persons in various creativity skills. Part 1 produces ability to generate many unique solutions rapidly to various types of personal, social and physical problems, and to produce such solutions as a member of a group as well as individually. Part 2 produces the ability, again as individuals and as group members, to avoid closure by eliminating solutions according to discovered criteria or assumptions. Part 3 produces cognitive awareness in each learner of his high level of ability in, and produces increased approach behavior towards, solving problems. Part 4 produces the skill of consulting peers to help them: (1) to specify their perceptions of unsatisfactory situations in systemic terms; (2) to discover various solutions which amplify the potentials of all persons involved in each such situation to achieve their own desired goals; (3) to discover various ways to innovate preferred solutions effectively. In Part 4 persons serve in the 4 roles of client, counselor, evaluator and system developer. A Part 5, presently under development, involves use of PerforMax prior to Part 1, and training after Part 4 in use of various tools of problem solving (measurement, data analysis, statistics-English translation, flowcharting, and prospectus writing).

2. For children 10-14, learning sessions may vary from 25-50 minutes and may be held 2-10 times weekly without significantly affecting outcomes. Data for older learners are not yet available.

3. An external criterion recommended for PEP is Preferred Futures (permission for use must be obtained from Hawaii State Dept. of Education). Various internal criteria are provided as each learner reaches criterion on every portion of every part of PEP. Independent variables have been investigated for 48 normal 5th graders and 24 EMR's ages 10-14. Results are significantly improved scores in social studies, English and mathematics, significantly improved work orientation in class and increased production of homework, with no significant shift towards peer communications away from teacher communications. Since EMR's generally cannot read and write rapidly, high school student volunteers served as team recorders. No learning characteristics or affects of EMR's related significantly to recorder performance, and recorders' self-reports became significantly more favorable.

4. Parts 1-3 consist of 2 short films, a set of 21 prerecorded cassettes, sets of 3 PEP Notebooks, Solution Boards and Team Record Sheets. Part 4 consists of Reliability Sheets, Guide Cards, Criterion Flip Cards and Dialog Sheets.

5. PEP is a learning system which, for optimum effectiveness, requires relatively stable groups in Parts 1-3. If 4-person teams play when at least 2 members are present, absence rates as high as 30 percent do not significantly attenuate performance. In Part 4 no significant differences have been found between members of stable groups and individuals who rotate among groups.

6. For additional information about PEP write PEP Associates, P. O. Box 10263, Honolulu, Hawaii 96816.

# The Preferred Futures

## measures the capacity of education to empower humans to achieve their preferred futures

The Preferred Futures is a method for measuring changes in the ability of students in the public schools of Hawaii to cope and to delight in coping with their environments in 2,000+ when they will be in their prime. Measured changes in that ability can then be related to changes in the allocation of the Hawaii State Department of Education's resources.

Measurements are taken within a pattern of problem-centered activities unified through a Learning Fair. The Fair consists of up to 30 Booths of three major types, each with appropriate materials and supplies: (1) thinking (cognitive-intellectual) Booths; (2) doing (behavioral-vocational) Booths; (3) feeling (affective-esthetic) Booths. Examples of thinking Booths are solution productivity, flowcharting and information accessing. Examples of doing Booths are vehicle manipulation, assembly from printed instructions and vocational prediction. Examples of feeling Booths are affective communication, empathy and art recognition.

Each year a 5 percent sample of schools with 3rd, 6th, 9th and 12th graders (called E Graders or examinees), adjusted for socioeconomic levels, conduct a one-day Learning Fair at each school. The Fairs are attended by all children in those schools two grades below the E Graders, and by persons not enrolled in those schools. These 1st, 4th, 7th and 10th graders (called A Graders or attendees) are pretested one month prior to the Fair in their school. The Booths consist of problem-solving tasks arranged analogous to the games at a carnival. Each group of 20 E Graders selects its own Booth (except that the Booths must be equally distributed among the 3 types), they prepare their own activities without supervision, and they strive during the Fair to encourage A Graders to participate in their Booth and to take their Booth posttest one week later.

By subtracting pretest from posttest scores, numerical values indicating direction and magnitude of changes are calculated. This set of change scores becomes the measure of the effectiveness of E Graders in producing improvement in the performance of A Graders. Various subsets of measures relate to the eight objectives specified by the Hawaii State Department of Education for its Educational Foundations Program.

The various change scores for two consecutive years of Learning Fairs are specified as a single Learning Fair productivity index (the C & I Index) which can be plotted on a graph in the manner of a Dow-Jones Industrial Index. And, in much the same way that the D-J Index can be used by businesses to assess changes in their performance, fluctuations in the C & I Index can be monitored to assess Departmental performance in its quest for excellence in education.

It is imperative to understand that it is the change in the change scores from one year's Learning Fairs to the next that is critical and fundamental to this assessment. It is the improvement in the change scores that reflects the effectiveness of the Department in achieving its Educational Foundations Objectives. This assumes that changes in students' abilities to produce gains in learning how to find and implement solutions to a wide range of life-like and novel problems are a valid measure of Departmental effectiveness.

This assumption is deeply rooted in the abiding belief that, although the future is uncertain, man has the power to create it. Humans acquire that power by being prepared to cope and to enjoy coping with a wide range of complex problems in a multitude of environments. Excellence in education, therefore, provides children with the power to create those futures they prefer.

The Preferred Futures Technical Report specifies computer procedures for refining the measurement design. Both simple and complex research methodologies are to be employed to answer a host of important theoretical and practical questions related to validity, reliability, curricular impact, etc. Relationships to other Departmental assessment activities are identified. The Report provides techniques for modifying the assessment process to meet whatever changes may occur in the educational mission or whatever contingencies may arise in assessment needs. And a set of recommendations for innovating the assessment process is included.

Copies of the Preferred Futures Technical Report may be obtained from Dr. Phillip Ige, Asst. Supt. for Curriculum and Instruction, Hawaii State Dept. of Education, 12th Floor, Queen Emma Bldg., Honolulu, Hawaii 96813.

PerforMax

a learning system which enables each learner in 20-32 training hours to become a highly effective communicator in face-to-face vocational situations

1. Learners work individually and in groups of 3 on Competence Programs. Competence Programs enable learners to train one another in each of 3 types of Performance Programs. After 2-4 hours of programmed learning in a Competence Program, a learner is ready to participate in a Peformance Program.

2. In every Performance Program session each learner serves 15 minutes in each of 3 roles: Communicators A and B, and Evaluator. In each role he modifies the communication behaviors of the other 2 learners and the other 2 modify his own behaviors. They work to reach criterion on 1 variable at a time. Learners record data and chart one another's progress. The 3 Performance Programs are intelligibility (6 variables), flexibility (in asking and answering questions; 4 variables) and strategy (in coping with each type of communication situation; 18 variables). Learners make audio recordings of one another's criterion performances.

3. International Learning Systems, Ltd. (ILS) provides an external criterion measure of communication effectiveness (DyComm), or the user may use the Hawaii Communication Test (HCT), and/or any user-specified criterion such as ratings of randomly sequenced videotapes of pre- and post-training job interviews. Permission for use of the HCT must be obtained from the Hawaii State Dept. of Education, Office of the Supt., Queen Emma Bldg., Honolulu, Hawaii 96813.

4. ILS provides evaluations of data and recordings for those learners who do not reach external criteria. ILS specifies 1-3 hours of additional training for this 2-8 percent of the total learner population, after which practically all achieve all external criteria.

5. Training attitude is favorable at the outset and usually increases with additional training. Post-training surveys indicate no recidivism, and frequently continued improvement is found to occur. Based on thousands of persons' performances who have completed PerforMax, involving various types of populations, minimum exit criterion is the top 10 percent of the population's effectiveness in communication, but most learners exit in the top 5 percent of their population.

6. PerforMax is a system which, for optimum effectiveness, requires learners to work in groups of 3 so that no learner works with any other more than twice, and never with the same 2 learners. This can be achieved with a group as small as 12 with new learners entering as others exit, or with a fixed group of at least 22 persons. PerforMax also is designed and warranted to function only under the supervision of a clerical or paraprofessional person trained by ILS.

7. For additional information about PerforMax write ILS, P.O. Box 10686, Honolulu, Hawaii 96816.

DyComm

measures a person's ability to achieve 5 basic types of communication outcomes with each of 8 other persons in face-to-face situations

1. Persons in groups of 12-30 are seated in an inner circle of chairs facing an outer circle of chairs. Each person has a bound deck of IBM cards. An audio tape defines each communication task, and controls performance time. At the end of a fixed interval (25 sec. on Subtest A, 35 sec. on B, 45 sec. on all others) the tape signals each person in the inner circle to move one chair to his right to work with a new partner.

2. Each person at the outset has a partner for an orientation trial. He then works with each of 8 different partners on each subtest. When working with any partner, he has an IBM card and his partner has a corresponding card. Each pair of cards displays up to 20 items preceded by bubbles. Every other bubble is preceded by a dot. A dot indicates that, for that item, that person communicates about that item to his partner. His partner then signals whether, on the basis of information about that item on his own card, they both should or should not mark their bubbles for that item. On Subtest A both should mark if the word on both cards is exactly the same, on B if both sentences mean almost the same thing, on C if what is said accurately describes the figure, and on D if the partner's non-verbal communications infer the characteristics indicated. On E no dots appear, items are identical on both partners' cards, and both partners mark bubbles for groups of letters which satisfy both rules on both partner's cards.

3. Total test time is 50 minutes. Cards are processed by an IBM 360 series computer with a 3501 optical scanner, or they can be hand-scored with stylii and pre-punched scoring matrixes. Score on each subtest is items correctly marked minus items incorrectly marked over all 160 items (20 items with each of 8 partners). Computer output is raw scores and percentiles for the population tested.

4. For measurement of communication between populations (e.g., older and younger students, students-teachers, employers-employees, employees-customers, etc.) every other person in the outer circle is a member of the other population. Data then include both within-group and between-group scores and the correlations between them for each communicator, as raw scores and as percentiles for his population.

5. For additional information about DyComm write ILS, P. O. Box 10686, Honolulu, Hawaii 96816.